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(54) Break away operating cord system for retractable coverings for architectural openings

(57) A break away operating cord system for retractable coverings for architectural openings such as windows, doors, arches or the like includes a mounting plate (44) to which an operating cord (30) is attached and wherein the mounting plate is releasable from the remainder of the control system for the retractable covering allowing the operating cord to be separated from most of the covering to avoid injury to a child or infant whose head might be trapped within the closed operating cord loop.

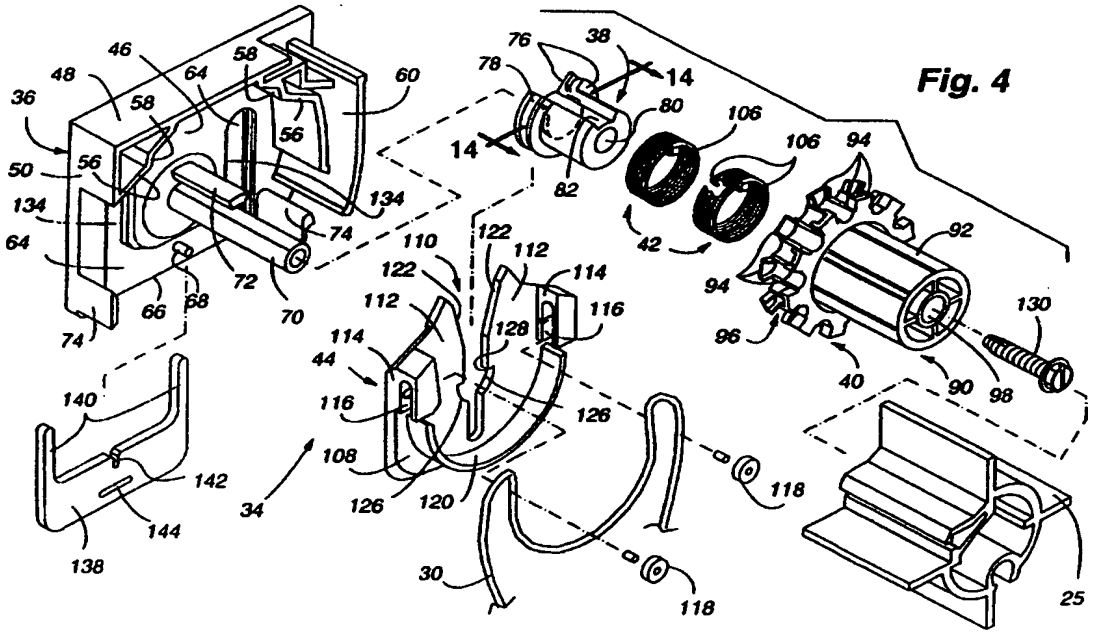

Fig. 4

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Description

The present invention relates generally to retractable coverings for architectural openings and, more particularly, to safety operating cord systems for such a covering.

Retractable coverings for various architectural opening such as windows, doorways, archways, and the like typically include a retractable barrier which might be a drapery, mini-blind, vertical blind or the like. Such retractable window coverings are typically operated with at least one pull cord system. The operating cord system can be used to extend or retract the covering across the architectural opening or to manipulate vanes utilized in the covering into various positions when the covering is extended. In either event, a pair of cords or a closed loop cord typically depend from one end of the covering for hand manipulation by an operator.

When the pull cord has two free ends, they are many times interconnected to form a closed loop to facilitate operation of the covering. Endless cords are also utilized. The closed loop or endless cords pose an inherent danger to young children and infants in that should the head of the child or infant become entangled in the operating cord, the child or infant can be inadvertently hung or otherwise badly injured.

To resolve the inherent danger presented by operating cords that have their ends interconnected to establish an endless loop, safety systems have been devised. For example, where two free ends of a operating cord are interconnected with a connector, some connectors have been designed to separate or disengage the connection of the free ends of the cord upon a particular force being applied to the cords. An example of such a system is shown in U.S. Patent No. 5.518.057 issued May 21, 1996. The system disclosed in the patent utilizes a cap in which one end of the operating cord can be securely fixed and in which the opposite end of the operating cord can be releasably fixed such that when a separating force is provided between the two operating cords in effect increasing the separation between the cords, the releasable end of the operating cord is allowed to pass through an enlarged slot in the cap so that it is released from the cap thereby allowing the two cords to be separated so that even if a child or infant's head were caught between the two depending portions of the operating cord, it would not cause injury as the effective endless nature of the cord would have been eliminated.

Another example of a safety system is disclosed in U.S. Patent No. 4,909,298 issued March 20, 1990. In this system the connector at the free ends of an operating cord is designed to separate into two parts upon predetermined forces applied thereto such that each cord end remains connected to one part of the connector but the operating cord is thereby separated to avoid injury to a child whose head may have been caught in the cord.

It is also well known in the field of retractable coverings for architectural openings to provide clutch systems between the operating cords and tilt rods, control rods or roll bars used in the operation of the covering so that the tilt rod or the like can only be rotated under desired conditions. In a typical system, the operating cord is operatively engaged with a drive wheel which is coupled to the tilt rod with the clutch system so that neither the drive wheel nor the tilt rod will rotate unless an axial pulling force is applied to one depending portion of the operating cord or another. Such an arrangement, for example, prevents a window shade from coming unrolled due to the weight of the shade unless their is a desired manipulation of the operating cord.

Current art is devoid of a reliable system for preventing the above described injury to children or infants inasmuch as prior art systems are dependent upon a particular separating force being applied between the two depending portions of the operating cord, but if the operating cord is twisted, knotted or the like, the force may not release the operating cord from the connector and resultant injury to the child may occur.

To date, almost all of the attention directed to childproofing operating cords has been focused on the connector at the lower free end of the operating cord, but as mentioned previously, certain limitations are presented when trying to resolve the problem by focusing on the free ends of the cord and their interconnection with each other.

It is to overcome the shortcomings in the prior art and to provide a new and improved system for releasing a operating cord from its operative connection with the control mechanism of an architectural covering that the present invention has been developed.

The present invention relates to a system for childproofing the operating cord system on retractable coverings for architectural openings wherein the entire cord is designed to break away from the control system for the covering under pre-selected conditions. The system has also been uniquely designed so that should its user desire, the break away feature can be deactivated.

The break away operating cord system of the present invention is designed for use at the control end of the headrail of a retractable covering where a control rod, tilt rod, roll bar or the like that extends horizontally across the top of the covering is rotatably manipulated. The roll bar or the like is operatively engaged with a drive wheel about which the operating cord extends in frictional engagement therewith so that the application of an axial pulling force to either depending portions of the operating cord causes rotation of the drive wheel and thus the roll bar. A clutch system is also incorporated into the control system and prevents rotation of the roll bar unless an axial pulling force is applied to only one depending portion of the operating cord or the other but the roll bar will not rotate if two axial pulling forces of substantially the same degree are simultaneously applied to the two depending portions of the operating cord or if there are no forces being applied, so that the roll bar remains locked in a static state unless it is desired

to rotate the same.

For purposes of the present disclosure, the operating cord will be defined as an endless cord including first and second depending portions, with these portions referring to the portions of the operating cord which depend from opposite sides of the drive wheel. In other words, the operating cord in its operative engagement with the drive wheel depends from the wheel in two separate portions such that an axial pulling force applied to one portion will rotate the drive wheel in one direction, while an axial pulling force applied to the other portion will rotate the drive wheel in the opposite direction. As mentioned previously, if an axial pulling force of substantially the same degree is simultaneously applied to both portions of the cord, the drive wheel will not rotate nor will the drive wheel rotate if no force is applied to any portion of the operating cord as the clutch system operates as a break to prevent rotation except under the predesignated conditions of an axial pulling force being applied to one or the other of the cord portions.

The operating cord in accordance with the present invention is slidably attached to a mounting plate which in turn is releasably mounted on a mounting support. The mounting plate is releasably connected to the mounting support by a system that permits the mounting plate to be released from the mounting support if substantially equal simultaneous axial pulling forces are applied to both cord portions such as when the weight of a child or infant is applied to the operating cord from between the two cord portions (i.e., the infant's neck is caught in the bottom of the cord loop). Alternatively, if only one of the cord portions is being pulled at any one time, the mounting plate will remain secured to the mounting support. In this manner, the retractable covering can be desirably operated to reversibly rotate the drive wheel and consequently the roll bar or the like, but under the unusual circumstance where both cord portions are pulled at the same time, the mounting plate is released from the mounting support thereby disengaging the operating cord from the control system such that injury can be avoided to a child or infant whose head may become entangled in the operating cord portions.

Other aspects, features and details of the present invention can be more completely understood by reference to the following detailed description of a preferred embodiment, taken in conjunction with the drawings and from the appended claims.

Fig. 1 is a fragmentary isometric view looking at the back side of a vertical vane-type architectural covering utilizing an endless operating cord in its operation and with a stick figure of a child caught in the operating cord shown in phantom lines.

Fig. 2 is an enlarged fragmentary view taken along line 2-2 of Fig. 1.

Fig. 3 is a fragmentary isometric view looking at the end of the retractable covering having the operating cord therein.

Fig. 4 is an enlarged and exploded isometric view taken along line 4-4 of Fig. 3 but with the roll bar shown in reduced size for convenience.

Fig. 5 is an enlarged section taken along line 5-5 of Fig. 2.

Fig. 6 is an enlarged section taken along line 6-6 of Fig. 2.

Fig. 7 is a fragmentary section showing a side portion of the headrail incorporating the present invention wherein the locked plate that prevents release of the operating cord has been removed.

Fig. 8 is a fragmentary enlarged isometric view showing the drive wheel mounted on the mounting plate and separated from the mounting support.

Fig. 9A is an isometric view showing the back side of the mounting plate which is releasably seated upon the central hub and showing the lock plate separated therefrom in solid lines and in a locking position in dashed lines.

Fig. 9B is an enlarged isometric similar to Fig. 9A with parts broken away for clarity.

Fig. 10 is an axial view from the left of the assembly as illustrated in Fig. 5, with the mounting plate being in a centered or neutral position.

Fig. 11 is a view similar to Fig. 10, with the right-hand portion of the operating cord having been axially pulled to tilt the mounting plate to the right.

Fig. 12 is a view similar to Fig. 11 showing the mounting plate tilted to the left as by an axial pulling force to the left side portion of the operating cord.

Fig. 13 is a frontal view of the mounting plate being partially separated from the mounting support and the mounting hub which is disposed on the mounting support.

Fig. 14 is an end elevation of the central hub showing the unusual configuration of the inner surface of the annular groove therein.

Retractable coverings for architectural openings such as windows. doors, archways and the like take various forms. The present invention will be described in connection with a vertical vane covering 20 of the type shown in Fig. 1 and described in more detail in U.S. Pat. No. 5,313,999 issued May 24, 1994 which is commonly owned with the present application. The covering includes a pair of flexible sheets 22 connected at spaced intervals by flexible horizontal vanes 24. The sheets are suspended in a vertical orientation from a control system 24 in a headrail 26 for the covering. It should be appreciated, however, that the present invention would find usefulness in other commonly available coverings.

The control system 24 for the covering shown in Fig. 1 includes a roll bar 25 about which the sheets and vanes are selectively rolled through rotation of the roll bar that is controlled by an operating cord 30. The roll bar may be of the type described in detail in U.S. Application Serial No. 08/198,317 filed February 18, 1994, which is of common ownership with the present application, and is hereby incorporated by reference.

Figs. 2 through 4 illustrate the end of a headrail 26

of the architectural covering where the operating cord system 34 of the present invention is incorporated, and it can be appreciated that the system can be fully incorporated into the headrail of the architectural covering for aesthetic purposes.

The operating cord system 34 of the present invention is probably best understood by reference to Fig. 4 where the component parts of the system are shown in exploded relationship. It will there be seen that the operating cord system basically includes an end cap of the headrail 26 referred to hereinafter as the mounting support 36, a mounting hub 38 supported on the mounting support, a drive member 90 having a pair of clutch coil springs 42 disposed therein and mounted on the mounting hub, a releasable mounting plate 44 that is releasably connected to the mounting hub 38 and the endless operating or operating cord 30 supported by the mounting plate for operative engagement with the drive member. A portion of the roll bar 25, which does not form part of the operating cord system is also shown in Fig. 4.

The mounting support 36 can be seen in Figs. 2 and 3 to constitute the end cap for the headrail 26 of the retractable covering and also the base or support for the working components of the operating cord system 34. The mounting support includes a relatively flat base 46 which forms the end wall of the headrail with several component parts of the mounting support projecting inwardly from the flat base as best seen in Figs. 4 and 8.

Perpendicular projections from the base 46 define a top wall 48 and a side wall 50 which are coplanar with the corresponding top wall 52 and side wall 54 of the headrail 26, as best appreciated in Fig. 3. A pair of zig zag, segmented partitions 56 extend in a downwardly divergent direction from the top wall 48 of the mounting support, with each partition defining an abutment surface 58. An arcuate plate-like projection 60 is also provided along the opposite side from the side wall 50. The arcuate plate-like projection 60 is adapted to fit interiorly of a corresponding arcuate wall 62 of the headrail as best seen in Figs. 2 or 3. The inner surface of the base 46 from which the projection 60 protrudes has a U-shaped groove 64 formed therein. with the groove opening through the bottom edge 66 of the base. A guide pin 68 forms a centered projection from the groove 64 adjacent the bottom edge of the base, with the guide pin being in alignment with a support shaft 70 that extends perpendicularly from the base. Immediately above the support shaft 70, a stop arm 72 projects perpendicularly away from the base in spaced parallel relationship with the support shaft. Also projecting perpendicularly from the base 46 adjacent opposite sides of the bottom edge 66 are a pair of cord guide fingers 74, with one of the cord guide fingers being spaced from the lower edge of the arcuate plate-like projections 60 to define a channel through which the operating cord extends.

The mounting hub 38, as probably best seen in Figs. 4, 9A, and 9B, is a generally cylindrical body having a pair of spaced enlarged circular discs 76 at one end which define therebetween an annular groove 78. A central cylindrical axial passage 80 extends through the cylindrical main body and a generally U-shaped longitudinally extending channel 82 is formed in the top surface of the cylindrical body. The diameter of the cylindrical passage 80 is slightly greater than the diameter of the support shaft 70 on the mounting support so that the mounting hub can be seated on the support shaft for pivotal movement about its longitudinal axis. When seated on the support shaft, the stop arm 72 of the mounting support lies within the generally U-shaped channel 82. The U-shaped channel is slightly wider than the stop arm 72 for a purpose to be described in more detail hereafter.

As best seen in Figs. 9B and 14, the inner surface 84 of the annular groove of the mounting hub 38 is not circular, as are the circular discs 76, but rather has a semi-circular lower half 86 that terminates in substantially horizontal shoulders 88 that are, in turn, continuous with relatively straight vertical walls 89. The purpose of the unique configuration of the inner surface 84 of the annular groove 78 will be apparent with the description that follows. It will be appreciated, however, that when the mounting hub is disposed upon the support shaft 70, it is allowed to pivot about its longitudinal axis within limits substantially defined by the relative widths of the U-shaped channel 82 in the mounting hub and the stop arm 72 on the mounting support which is positioned within the channel 82.

The drive member 90, as best seen in Fig. 4, has a drive wheel 40 and a generally cylindrical main body 92 with the drive wheel integrally formed therewith at one end. The drive wheel has alternate radially extending teeth 94 along side edges thereof which define therebetween a channel 96 in which the operating cord 30 is releasably seated for driving engagement with the drive wheel. As probably best seen in Figs. 5 and 6, a cylindrical passage 98 extends through the drive member 90 and has a small diameter portion 100 within the cylindrical body and a relatively large diameter portion 102 also within the cylindrical body. but adjacent the end of the body having the drive wheel 40. The large diameter portion 102 with a recess 103 is slightly larger than the outer diameter of the cylindrical body of the mounting hub 38, so that the drive member can be rotatably mounted on the mounting hub.

The pair of clutch coil springs 42 are seated within the large recess 103 in the diameter portion 102 of the cylindrical passage 98 in the drive member 90, even though one such coil spring would also work satisfactorily. Each coil spring has a radially inwardly directed tab or engagement finger 106, as best seen in Fig. 4, at each end of the coil, with the tabs of each spring being circumferentially spaced from each other an arcuate distance slightly greater than the width of the stop arm 72 on the mounting support 36. The outer diameter of the coil springs is substantially equal to the inner diameter of the recess 103 in the cylindrical passage 98 in the

drive member, while the inner diameter of the coil springs is approximately equal to the inner diameter of the large diameter portion 102 of the passage 98. The coil springs are seated within the recess in the cylindrical passage in the drive member and are adapted to circumscribe the cylindrical body of the mounting hub when the drive member is positioned on the mounting hub. The tabs, or engagement fingers 106, on the coil springs are adapted to be positioned within the U-shaped channel 82 in the mounting hub adjacent to opposite sides of the channel, as probably best seen in Fig. 13. The cylindrical main body of the drive member defines a support hub for the roll bar 25 (as best seen in Fig. 4) that extends horizontally within the headrail of the retractable covering. The roll bar is operatively secured to the drive member in any suitable direct or indirect manner so as to rotate in unison with the drive member. It should be appreciated that with only minor modification, the drive member could be modified to operatively drive any other rotatable member or element such as a rod, gear, tube or the like, which might be found in coverings for architectural openings.

The coil springs 42 form part of a clutch system for selectively engaging and disengaging the drive member 90 to the mounting hub 38. The mounting hub is, of course, restricted to only minimal pivoting movement by the stop arm 72 of the mounting support being positioned in the U-shaped channel 82. When the clutch system is disengaged, the drive member is fixed to the mounting hub and thereby limited to the same minimal pivotal movement. Engagement of the clutch system, however, allows the drive member to rotate freely in either rotative direction, so as to rotate the tilt rod within the headrail as desired.

The mounting plate or force release mechanism 44. as probably best seen in Figs. 4, 9A, and 9B, supports the operating cord 30 and is releasably connectable to the mounting hub 38, so as to be released therefrom under prescribed conditions. The mounting plate will also be seen to constitute the operative component for engaging and disengaging the clutch system upon predetermined movement of the operating cord.

The mounting plate includes a base 108 having a generally U-shaped upwardly opening notch 110 formed therein which is defined by a pair of spaced clamp arms 112 that are flexible but resilient. The material from which the base plate 108 is made establishes the resilient and flexible nature of the clamp arms 112 with the material being a suitable plastic, the particulars of which would be well within the knowledge of those skilled in the art. A preferred material would be Delrin ®, a product manufactured by DuPont. Adjacent each side of the clamp arms, inwardly directed blocks 114 are formed on the base with downwardly and laterally opening channels 116 therethrough which are adapted to support a pulley 118 around which the operating cord 30 extends. A semi-circular guide plate 120 projects perpendicularly from the inner face of the base 108 of the mounting plate, with the radius of the guide plate 120 being slightly greater than the radius of the drive wheel 40 on the drive member 90. As will be appreciated with the description that follows, the space between the drive wheel and the guide plate 120 defines a confining channel in which the operating cord is disposed when the cord is in operative engagement with the drive wheel.

The generally U-shaped notch 110 formed in the base of the mounting plate 44 has side edges 122 which are generally upwardly and outwardly divergent. An enlarged recess 124 is defined in each side edge of the notch, which has an arcuate segment 126 and a horizontal lip 128. The arcuate segments 126 and horizontal lips 128 conform in size and configuration with the inner surface of the annular groove 78 in the mounting hub 38. Due to the flexible and resilient nature of the clamp arms 112 defined in the base of the mounting plate, the mounting plate can be releasably connected to the mounting hub by moving the mounting plate upwardly so that the clamp arms are received and guided within the annular groove 78. As the clamp arms are moved upwardly, they are forced to flex away from each other by the relatively larger diameter of the inner surface 84 of the annular groove 78 until the enlarged recesses 124 in the edges 122 of the clamp arms become aligned with the semi-circular lower half 86 and shoulders 88 on the inner surface 84 of the annular groove 78. When the mounting plate and mounting hub are so aligned, the mounting plate is releasably snapped onto the mounting hub, with the shoulders 88 of the inner surface 84 and the lips 128 on the mounting plate being in abutting engagement so that the mounting plate and mounting hub pivot unitarily. If the clamp arms are yieldingly separated from each other, however, it will be appreciated that the mounting plate 44 can be slid downwardly and released from the mounting hub 38.

In the assembly of the components of the break away operating cord system 34 of the present invention, the mounting hub 38 is first slid onto the support shaft 70 of the mounting support 36 with the circular discs 76 disposed adjacent to the inner surface of the base 46 of the mounting support. The stop arm 72 of the mounting support is positioned within the U-shaped channel 82 on the top of the mounting hub 38 so that the mounting hub is allowed to pivot slightly about its longitudinal axis. The drive member 90 with the coil springs 104 disposed therein is next advanced onto the cylindrical body of the mounting hub with the tabs or engagement fingers 106 of the coil springs being disposed on opposite sides of the stop arm and within the U-shaped channel, as best seen in Fig. 13. The drive member is secured to the mounting support 36 with a bolt-type fastener 130 having an enlarged head which is threaded into the end of the support shaft 70 with the head of the fastener overlying the end of the drive member 90 to prevent its removal from the support shaft while permitting rotation relative thereto.

As mentioned previously, with the parts assembled

as described, when the clutch is disengaged, the drive member 90 is locked by the coil springs to the mounting hub 38 so that the drive member is restricted to limited pivotal movement in unison with the mounting hub.

The operating cord 30 is next mounted on the mounting plate 44 so that the cord passes over the pulleys 118 and within the channels defined in the blocks 114 on the support plate. The cord is allowed to droop between the blocks 114 so that the cord lies in substantial conformance with the semi-circular cord guide plate 120. The support plate is then connected to the mounting hub 38 by advancing the support plate upwardly with the clamp arms 112 being guided within the annular groove 78 until the support plate is snapped onto the mounting hub within the annular groove 78 and for reasons described previously, the support plate is then keyed to the mounting hub for unitary pivotal movement therewith. It will also be appreciated that the drive wheel 40, as best seen in Figs. 5 and 6, is aligned with the cord guide plate 120 so that the operating cord is confined between the guide plate and the teeth of the drive wheel so as to remain in engagement with the teeth which grip the cord allowing the cord to rotate the wheel under predetermined conditions by applying axial pulling forces to one portion or the other of the cord as it depends from opposite sides of the drive wheel. It will also be appreciated that the guide plate when connected to the mounting hub pivots with the hub about the longitudinal axis of the hub, with this pivotal movement being illustrated best in Figs. 10 through 12.

In Fig. 10, the mounting plate 44 is shown vertically oriented in a centered position with the top edge of the clamp arms 112 being disposed adjacent to the downwardly divergent zig zag projections 56 on the base of the mounting support. If the right-hand portion of the operating cord, as viewed in Figs. 10 through 12, has an axial pulling force applied thereto, as shown in Fig. 11, the mounting plate 44 will be caused to pivot in a clockwise direction until the right clamp arm engages the abutment surface 58 on the associated zig zag projection. The abutment of the clamp arm with the zig zag projection, obviously, limits pivotal movement of the mounting plate and also the connected mounting hub. As the hub pivots in a clockwise direction, the left side wall of the U-shaped channel 82 formed in the mounting hub, as seen in Fig. 13, engages associated tabs 106 of the coil springs moving the tabs in a clockwise direction reducing the effective diameter of the coil springs and their engagement with the drive member 90 allowing the drive member to rotate in a counterclockwise direction, as is well known with spring clutches. Of course, pivotal movement of the mounting plate 44 in a counterclockwise direction, as viewed in Fig. 12, which results when the left side portion of the operating cord has an axial pulling force applied thereto, causes the reverse action so that the right side wall of the U-shaped channel 82 engages the other set of associated tabs on the coil springs reducing the effective diameter of the spring and allowing the drive member to rotate in a clockwise direction.

As will be appreciated, the pivoting or tilting movement of the mounting plate 44 is used to activate or deactivate the clutch system so that the drive member 90 can only be rotated upon a tilting or pivoting movement of the mounting plate which results from an axial pulling force on one portion of the operating cord or the other. Obviously, when neither operating cord portion is being pulled, the coil springs cause the mounting plate to be centered thereby deactivating the clutch and locking the drive member to the mounting hub so that the drive member is prevented from rotation. Accordingly, the drive member can only rotate when only one portion of the operating cord has an axial pulling force applied thereto.

It is important to appreciate that the pulleys 118 around which the operating cord 30 extends are disposed at an elevated position relative to the pivot axis of the mounting plate which is the longitudinal axis of the mounting hub 38, as best seen in Fig. 10. It will therefore be appreciated that when the pulleys are moved downwardly by axial pulling forces on the operating cord, the horizontal displacement between the pivot axis and the pulleys increases. Oppositely, as a pulley is elevated relative to the pivot axis upon pivotal movement of the mounting plate, the horizontal distance between the pivot shaft and the pulley decreases. Accordingly, when the mounting plate is pivoted in one direction or the other, one pulley becomes horizontally displaced further from the pivot axis while the other pulley becomes less displaced so that the clamp arms remain equally spaced and in positive engagement with the mounting hub for unitary pivotal movement therewith.

It will be appreciated, however, if both portions of the operating cord 30 have axial pulling forces applied thereto at the same time and of substantially the same magnitude, both pulleys 118 will be pulled downwardly at the same time causing each to be displaced a greater horizontal distance from the pivot axis. This displacement forces the clamp arms 112 to flex away from each other until the gap between the clamp arms is greater than the diameter of the inner surface 84 of the annular groove 78 in which they are disposed. The mounting plate 44 can thereby be pulled downwardly, along with the operating cord, and completely released from the remainder of the system. Such a simultaneous uniform pulling force applied to the depending portions of the operating cord is of the type which would be automatically applied to the operating cord if a child's or infant's head were disposed between the operating cord portions and moved downwardly by gravity as shown in Fig. 1 against the lowermost extent of the operating cord. In the event of such an occurrence, the operating cord is automatically released from the remainder of the retractable covering so as not to injure the child or infant.

In the event the owner or operator of the retractable covering did not desire such a releasable system, pro-

vision has been made for negating or deactivating the release of the mounting plate 44 from the remainder of the system. With reference to Figs. 9A and 9B, it will be appreciated that the outer face of the mounting plate 44 has a pair of arcuate ribs 132 formed thereon with these ribs being adapted to ride and pivot within the U-shaped groove 64 formed in the inner face of the mounting support 36. The arcuate ribs 132 are adapted to be disposed adjacent to the innermost surfaces 134 (Fig. 8) of the vertical legs of the U-shaped groove 64 when the support plate is in its neutral position of Fig. 10. A gap between the arcuate ribs and the outer edges 136 (Fig. 8) of the vertical legs of the U-shaped groove exists, with this gap being necessary to allow the mounting plate to pivot relative to the mounting support in normal operation of the break away operating cord system.

A lock plate 138, as seen in Figs. 4, 9A, and 9B, is adapted to cooperate with the mounting plate and the mounting support to prevent release of the mounting plate from the mounting support. As will be appreciated, the lock plate is of generally U-shaped configuration defining a pair of relatively thin upstanding legs 140. The lock plate is adapted to be inserted into the U-shaped groove 64 of the mounting support so that the upstanding legs 140 on the lock plate fit within the gap defined between the arcuate ribs 132 and the outer edges 136 of the U-shaped groove. When the lock plate is in this position, there is still enough freedom of movement of the arcuate ribs to permit the support plate to pivot enough to operate the clutch system, but the clamp arms cannot be simultaneously separated far enough to release the support plate from the mounting hub. The lock plate has a guide groove 142 formed therein adapted to cooperate with the guide pin 68 on the mounting support so as to properly position and retain the lock plate when used. The lock plate also has a small elongated slot 144 formed therethrough of a size adapted to receive the head of a screwdriver or the like so that the lock plate can be easily removed from the mounting support to allow the release feature of the system to be operative.

It will be appreciated that the aforedescribed break away operating cord system will very dependably avoid injury to a child or infant whose head is caught within the closed end of an operating cord, as uniform pulling forces are naturally applied in such an instance to both depending portions of the cord causing a quick and automatic release of the support plate and thus the attached operating cord from the remainder of the retractable covering. The system is also designed to be cooperative with the clutch system typically found in control systems for retractable coverings so that the rotating control rod, tilt rod or roll bar, whichever the case may be, is restricted from rotative movement unless it is desired to rotate the control rod or the like in one rotative direction or the other.

Although the present invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made by way of example, and changes in detail or structure may be made without departing from the spirit of the invention as defined in the appended claims.

Claims

1. A break away cord system for operating a retractable covering device for an architectural opening, said covering device including a retractable barrier adapted to extend across the architectural opening and a cord operated control system for manipulating the barrier through rotation of a rotatable member in the control system, said cord system comprising in combination:

   an operating cord operatively engageable with said rotatable member to selectively and reversibly rotate said rotatable member, said operating cord having first and second portions depending from opposite sides of said rotatable member such that an axial pulling force on said first portion causes said rotatable member to rotate in a first direction and an axial pulling force on said second portion causes said rotatable member to rotate in an opposite direction, and

   a release system supporting said operating cord such that simultaneous axial pulling forces applied to said first and second portions disengages said operating cord from operative engagement with said rotatable member and separates said operating cord from the retractable covering.

2. A system according to claim 1, wherein said release system includes a mounting plate supporting said operating cord for selective operative engagement with said rotating member and a mounting support releasably supporting said mounting plate.

3. A system according to claim 2, wherein said mounting plate is pivotally and releasably supported on said mounting support.

4. A system according to claim 3, wherein said mounting plate includes a pair of flexible clamp arms yieldingly biased into a clamping position in which position the clamp arms releasably retain the mounting plate on the mounting support.

5. A system according to claim 4, wherein said mounting support includes abutments to substantially prevent flexing of said clamp arms upon either an axial pulling force on said first portion of the operating cord or an axial pulling force on the second portion of said operating cord, but not upon substantially

equal and simultaneous axial pulling forces on both said first and second portions of the operating cord.

6. A system according to claim 5, wherein said abutments limit the pivotal movement of said mounting plate.

7. A system according to claim 4, 5, or 6 further including a removable lock plate releasably mountable on said mounting support in a position to limit flexing of said clamp arms to prevent a release of said mounting plate from said mounting support.

8. A system according to any one of claims 2 to 7, wherein said rotatable member is a drive wheel and wherein a clutch system is operatively connected to said drive wheel to selectively prevent rotation of said drive wheel.

9. A system according to claim 8, wherein said clutch system is selectively engageable and disengageable such that, when the clutch system is disengaged, the drive wheel is prevented from rotating and, when the clutch system is engaged, the drive wheel is reversibly rotatable by axial pulling force on one or the other, but not both simultaneously, of the first and second operating cord portions.

10. A system according to claim 9, wherein said mounting plate is reversibly pivotable by axial pulling forces on one or the other of said first and second operating cord portions and pivotal movement of said mounting plate engages said clutch system.

11. A system according to claim 10, wherein pivotable movement of the mounting plate in a first direction engages the clutch system to allow the drive wheel to rotate only in a first direction and pivotal movement of the mounting plate in an opposite direction engages the clutch system to allow the drive wheel to rotate only in an opposite direction.

12. A system according to claim 11, wherein said clutch system includes a coil spring frictionally engaged with said drive wheel when the coil spring is in an at rest position and the clutch system is disengaged, said coil spring being substantially fixed in position to prevent rotation of the drive wheel when the clutch is disengaged.

13. A system according to claim 12, wherein said coil spring has engagement means which can be manipulated to change the diameter of the coil spring to permit rotation of the rod relative to the coil spring, said engagement means being selectively engageable upon pivotal movement of said mounting plate.

14. A system according to claim 12 or 13, wherein a mounting hub is pivotally mounted on said mounting support and releasably connected to said mounting plate for unitary pivotal movement therewith, said mounting hub being selectively engageable with said engagement means on said coil spring upon pivotal movement of said mounting plate.

15. A system according to claim 14, wherein a stop member on said mounting support cooperates with said mounting hub to permit pivotal movement of the mounting hub while prohibiting rotational movement of the mounting hub.

16. A system according to claim 15, wherein said mounting plate includes a pair of flexible clamp arms yieldingly biased into a clamping position in which position the clamp arms releasably connect the mounting plate to the mounting hub.

17. A system according to claim 16, wherein said mounting support includes abutments to substantially prevent flexing of said clamp arms upon either an axial pulling force on said first position of the operating cord or an axial pulling force on the second portion of the operating cord but not upon substantially equal and simultaneous axial pulling forces on both said first and second portions of the operating cord.

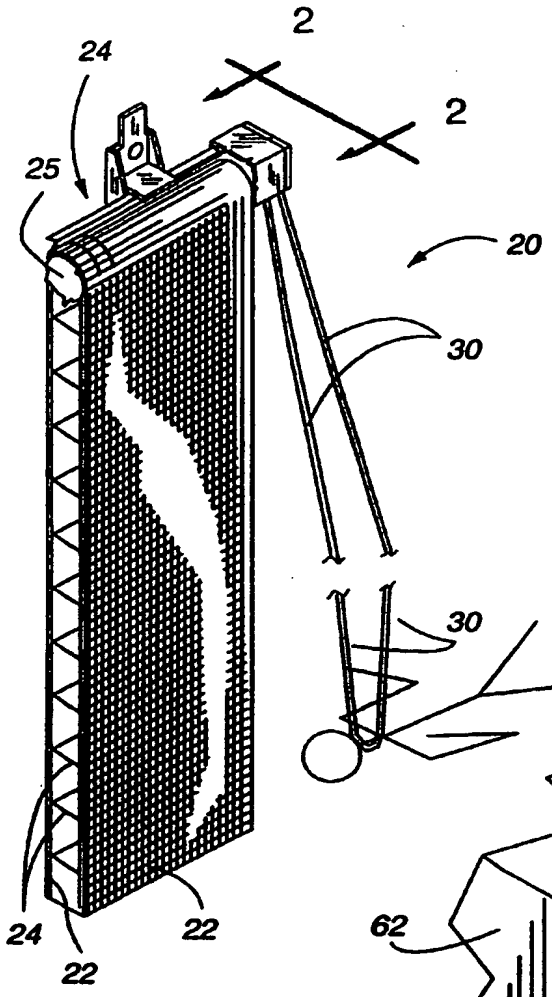

FIG. 1

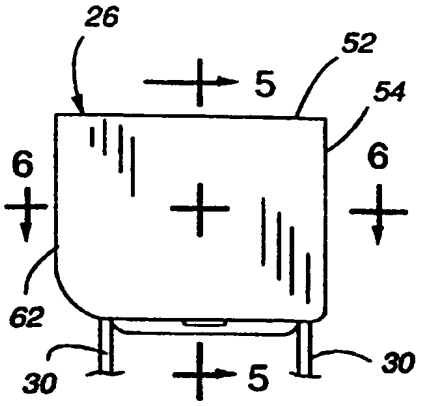

FIG. 2

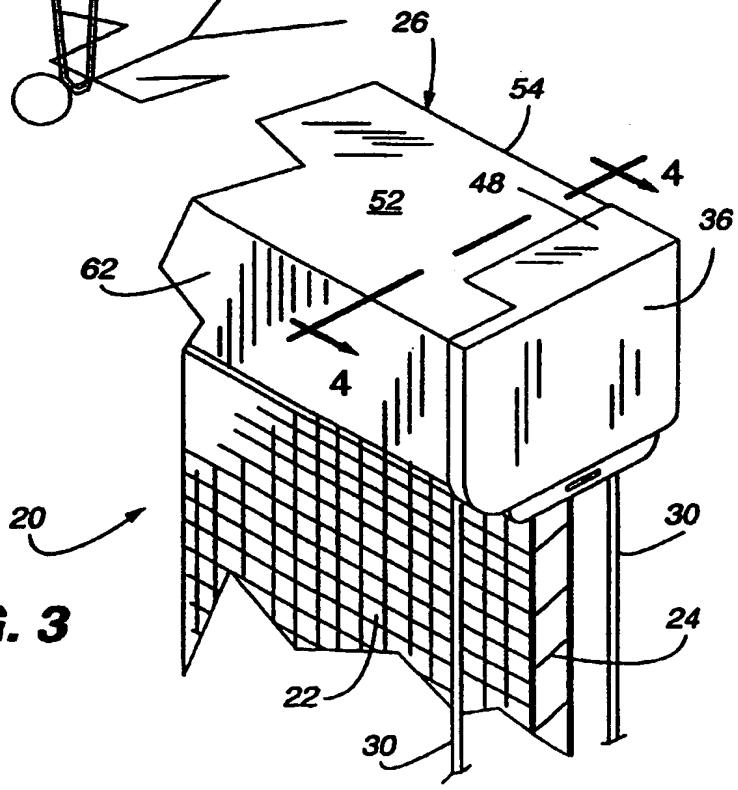

FIG. 3

Fig. 4

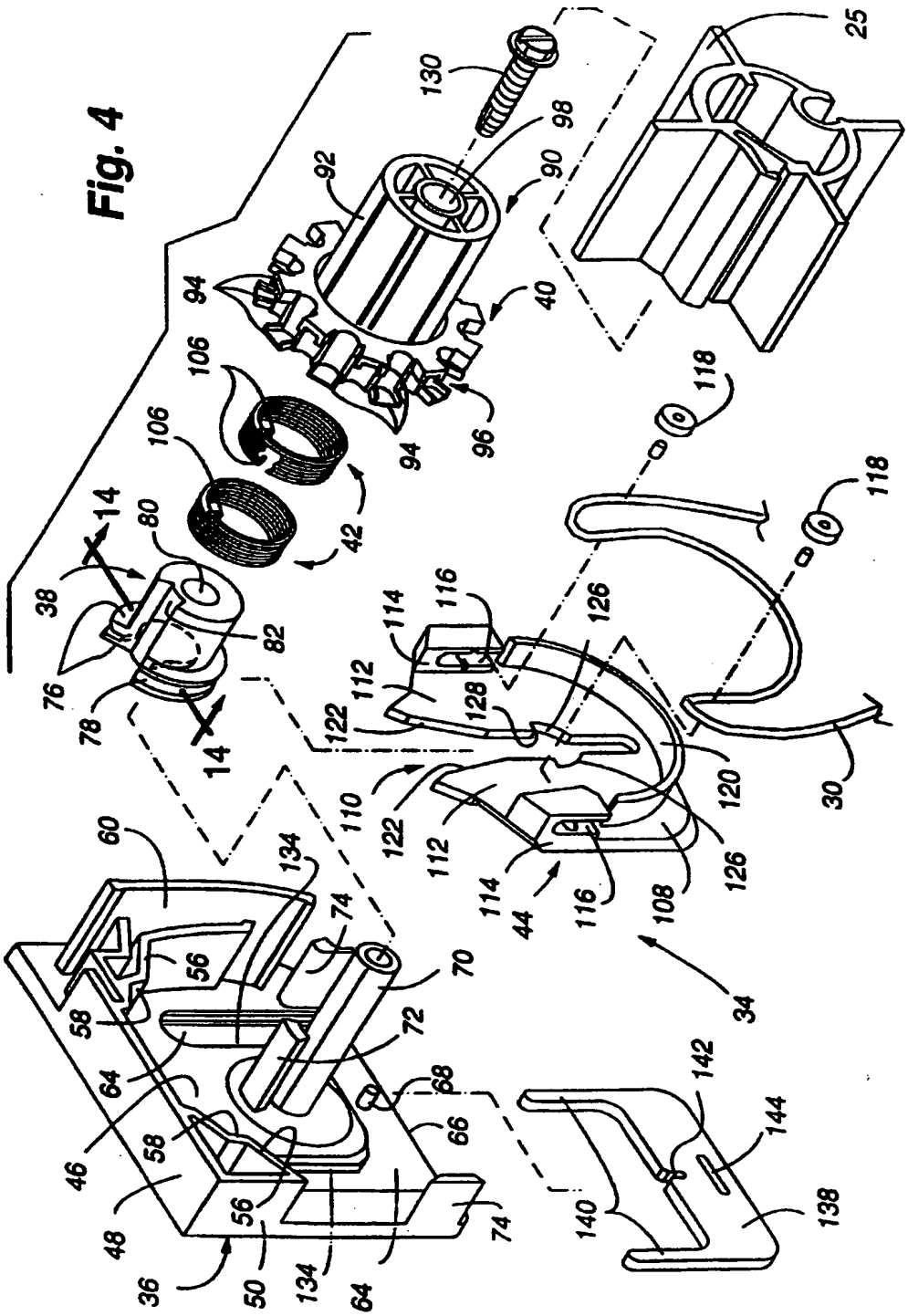
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Fig. 5

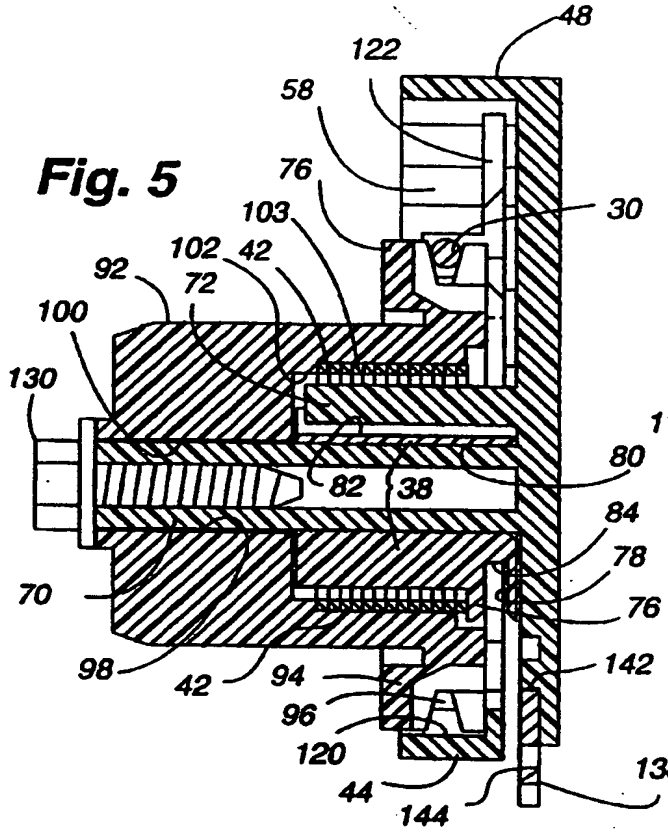
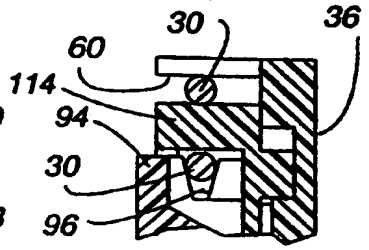


Fig. 7



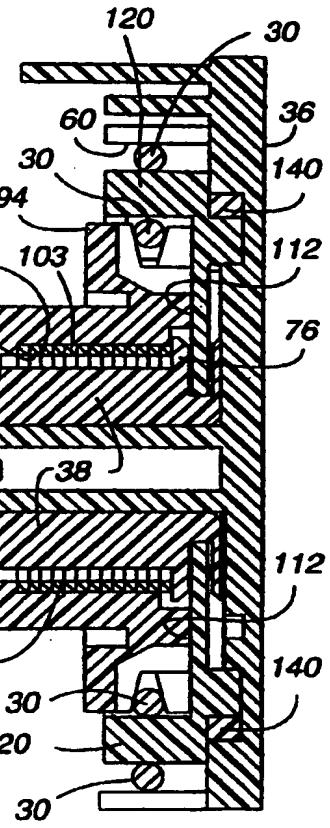
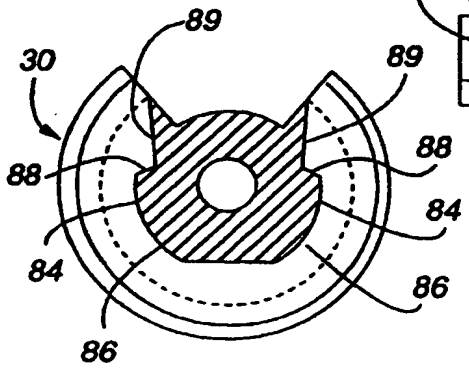


Fig. 6

Fig. 14



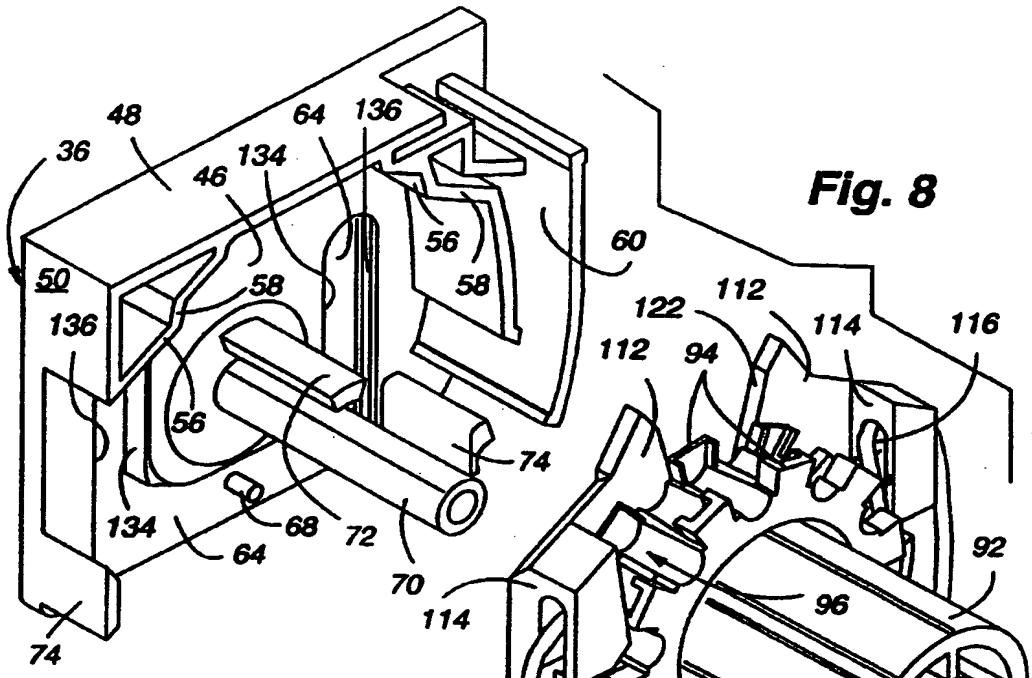


Fig. 8

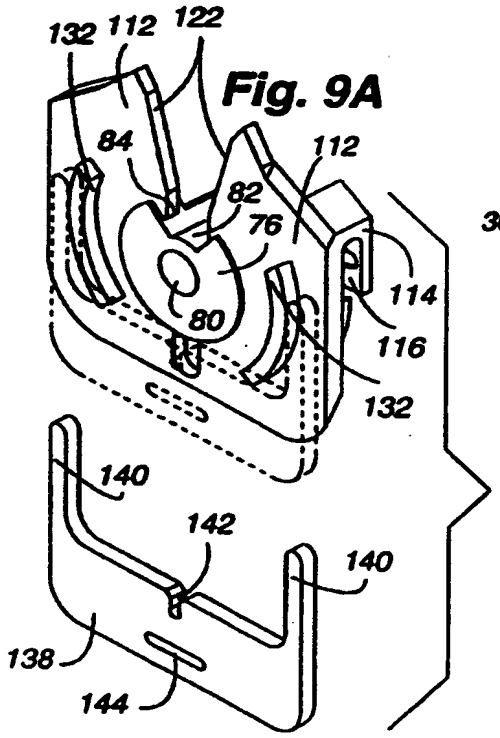


Fig. 9A

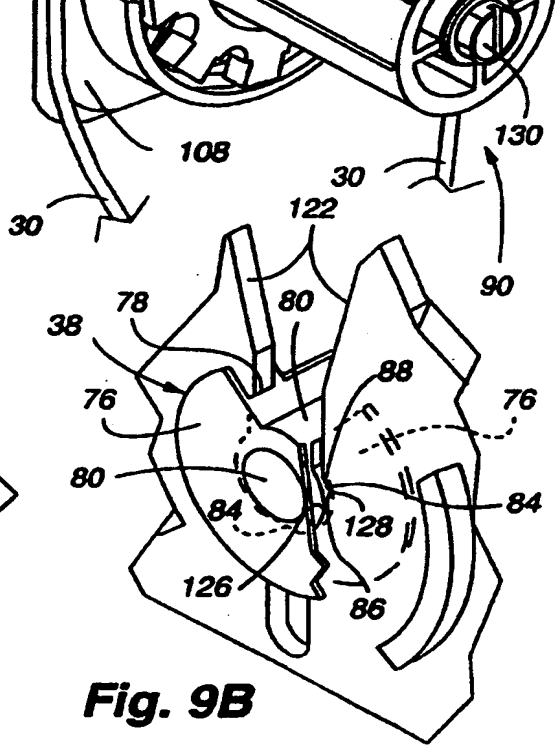


Fig. 9B

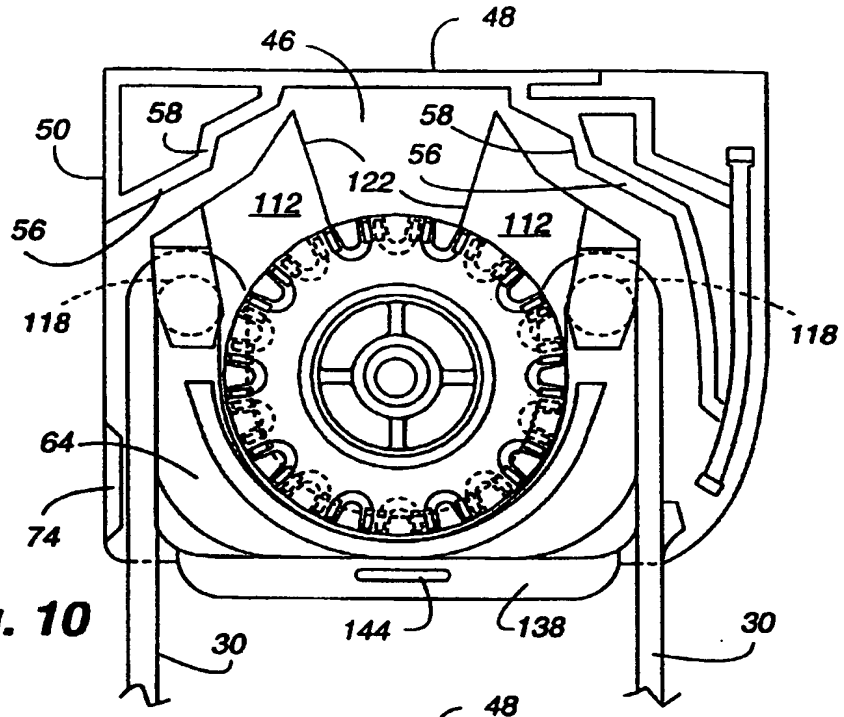

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Fig. 10

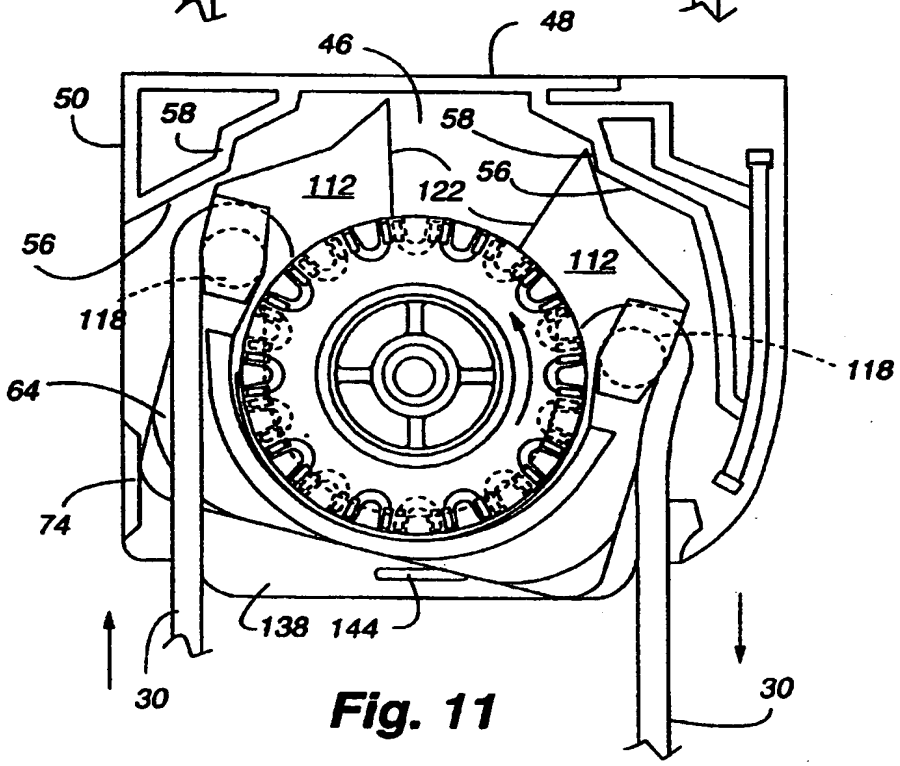
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Fig. 11

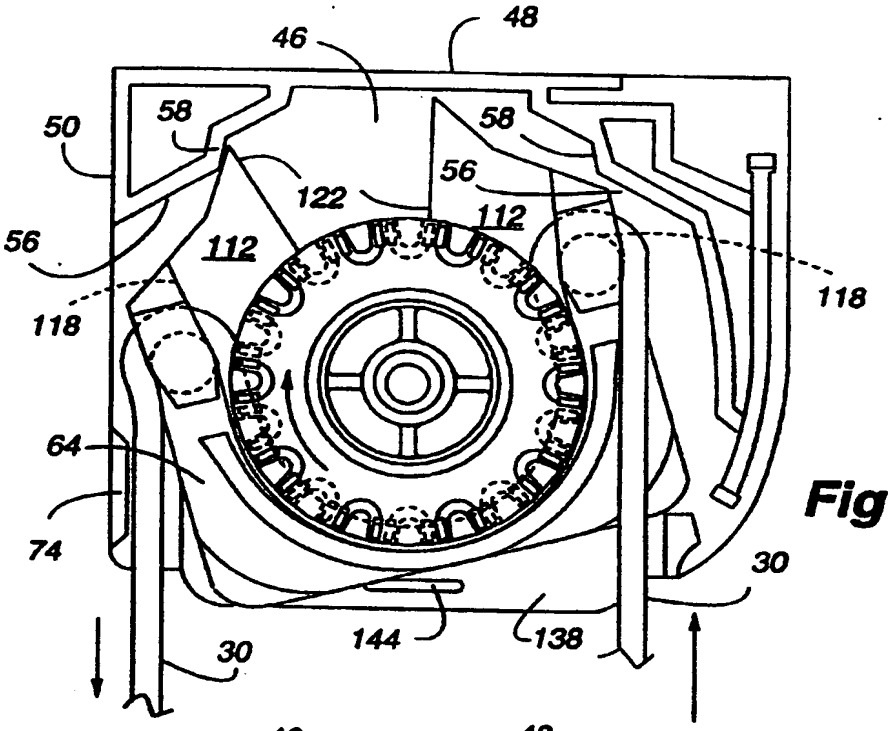
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Fig 12

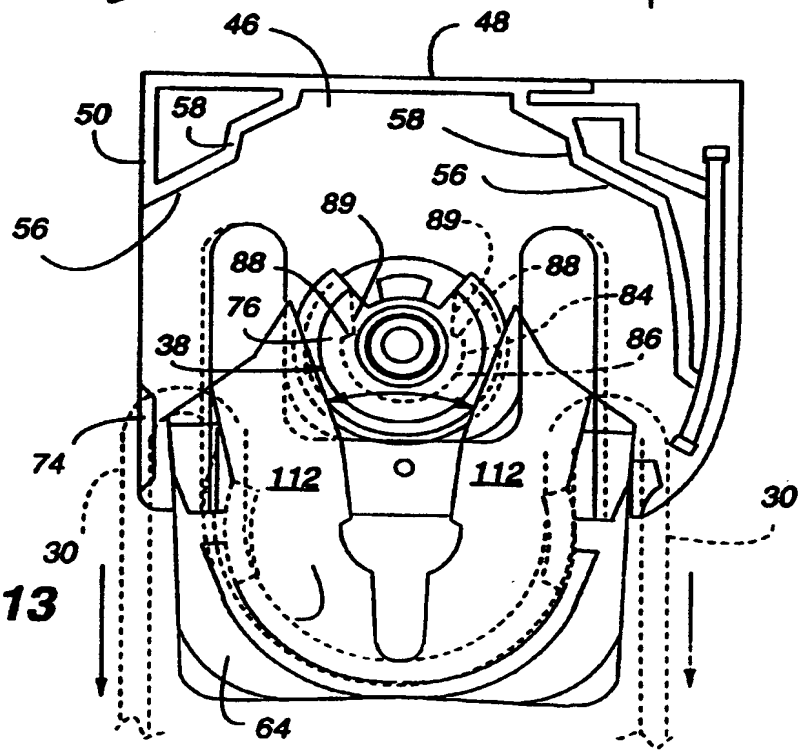
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Fig 13

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 98 30 2562

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
D,A	US 5 518 057 A (HUANG CHUNG-CHEN) 21 May 1996 * column 2, line 48 - line 58; figures *	1	E06B9/78 E06B9/326
D,A	US 4 909 298 A (LANGHART RICHARD M ET AL) 20 March 1990 * the whole document *	1	
A	US 5 361 822 A (NIJS FREDERIK G J) 8 November 1994 * the whole document *	8-14	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

E06B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	13 July 1998	Fordham, A

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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(51) INT CL⁴
E06B 9/20

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E1J
Selected US specifications from IPC sub-class E06B

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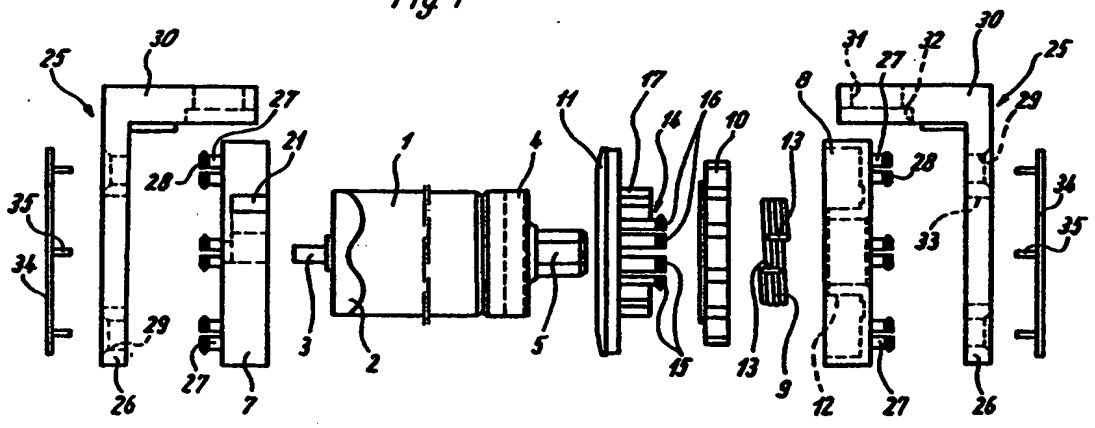
(54) Side pull roller blind mechanism

(57) In a side pull roller blind a drive housing (8) has lateral fixing elements (27) which lie within the outline of a drive wheel (10). The fixing elements (27) as well as corresponding receiving elements (29) on a carrier (25) are disposed in a circle in a pitch configuration which permits multiple relocation. The other side of the side pull roller blind and a carrier at that location are also of a corresponding configuration. The drive housing (8) carries a coiled clamping torsion spring (9) on a trunnion (12) and recieves an entrainment disc (11) which entrains for rotation one end of a roller blind roller, the entrainment disc (11) being drivingly connected to the drive wheel (10), via end members (13) of the spring (9). Such a side pull roller blind can be versatile while of simple design configuration with a small number of individual components.

Fig 1



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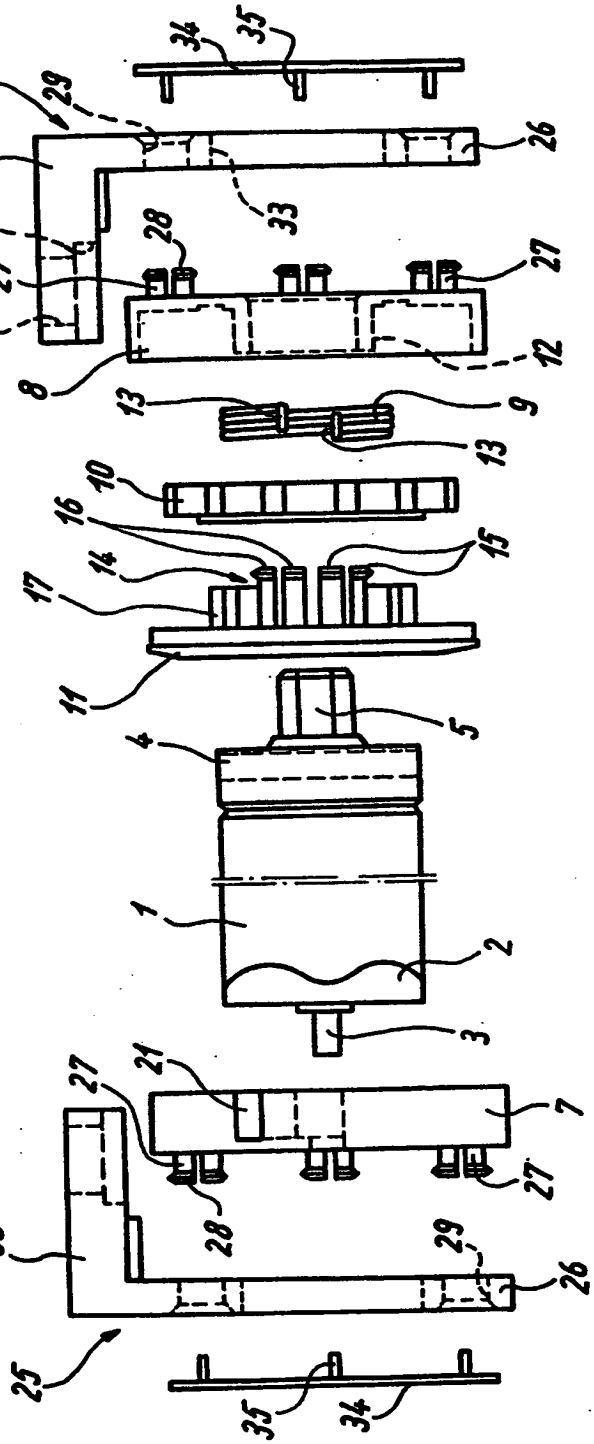

Fig 1

Fig.2

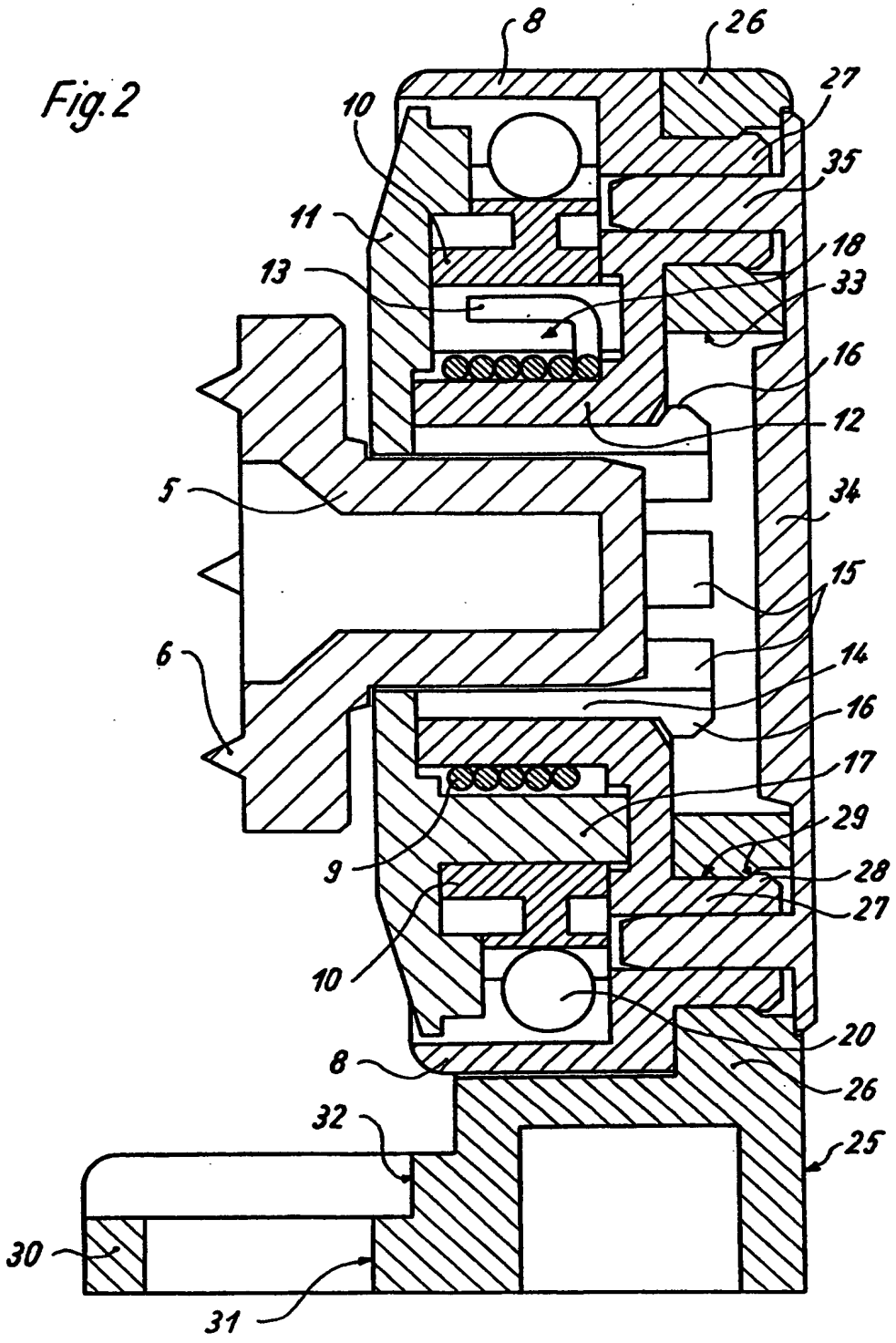
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Fig. 3

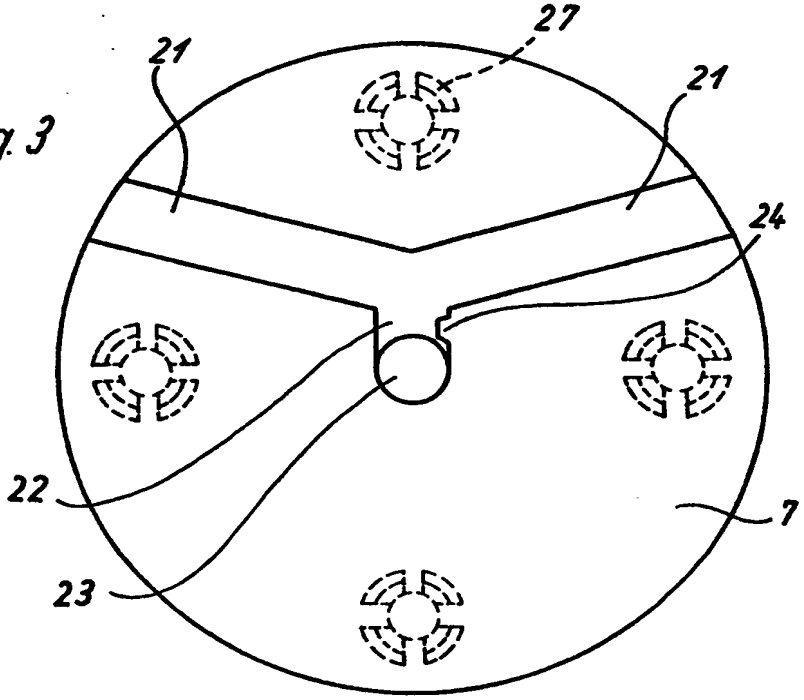
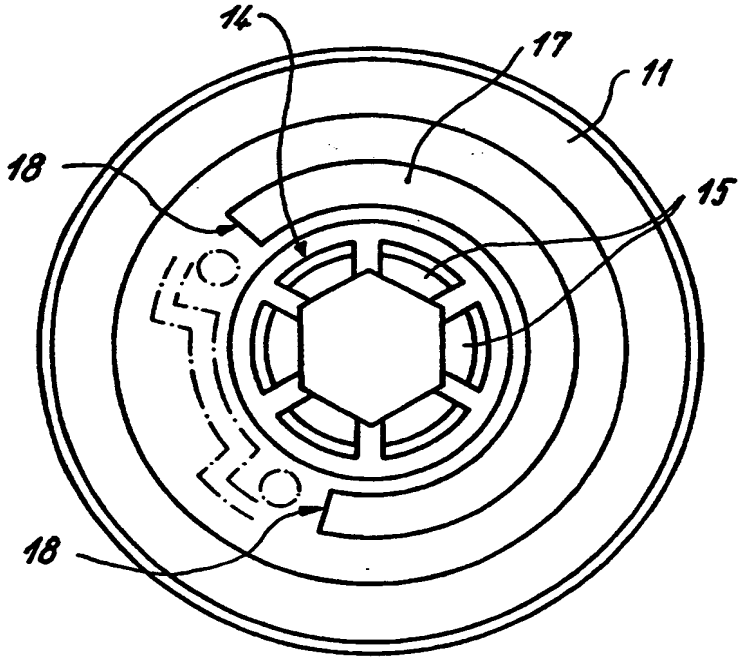


Fig. 4



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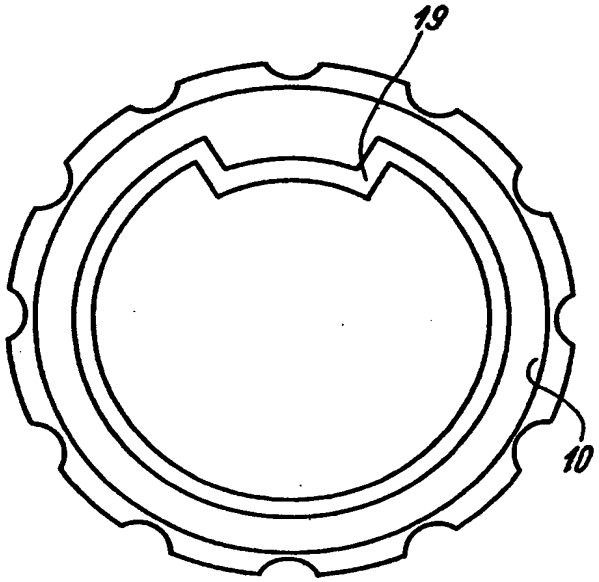

Fig. 5

SPECIFICATION

Side pull roller blind mechanism

The invention relates to a side pull roller blind mechanism.

Side pull roller blind mechanisms have been previously proposed comprising two carriers, a roller blind roller, an apertured member which mounts one end of the roller blind roller and is to be fixed to one of the carriers, and a drive means which has a drive wheel around which passes a pull element, is connected by a push-in type rotary entrainment connection to the other end of the roller blind roller, includes a clamping means releasable by pulling on the pull element and has a housing which has an exit opening for the pull element and is to be fixed to the other of the carriers.

Although, in a known side pull roller blind of this general kind, EP-A-0086000, with a sufficiently satisfactory mode of operation, the roller blind provides a simple structural design configuration which comprises only a small number of components, nonetheless that is achieved only at the expense of major disadvantages. Thus, the clamping device used therein is a clamping shuttle which is supported movably in a chamber in the drive housing and through which are passed the two runs of a pull cable which passes around the drive wheel in the housing. The result of this is that, it is not possible for that roller blind arrangement to use a chain drive comprising a chain drive wheel and a string of bead members, which is to be preferred in many cases from visual and functional points of view.

Having regard to a visually attractive appearance, normally, in conjunction with the pull cable, use is made of a heavy cable-tensioning member which is suspended from the pull cable. The use of such an arrangement can give rise to problems as there is the danger of the clamping action being released at an inappropriate time.

Although in this case the roller blind roller on the one hand, the drive means on the other hand and the associated carriers are each operational elements which are closed in themselves, nonetheless in the previously known construction the fixing elements on the drive housing are 1) arranged outside the outline of the drive wheel and 2) are provided in such a form that the drive means can be fixed to the carrier by way of the housing of the drive means only in a single orientation. However, it is desirable that one and the same system can be used in various ways, that is to say there should be the option of fixing it either to the wall and to the ceiling as well as in a recess, and the option of arranging it at the right or at the left. The provision of the fixing elements which in that arrangement also hold the two halves of the housing together, results in an extremely large size arrangement, having regard to the amount of space which is generally only available for the drive means and the housing thereof in such systems, so that, having regard also to the weak clamping shuttles, such an arrangement can only be used for light small roller blinds and therefore the requirement for the system to be capable of being used in as univeral a fashion as possible is not met.

Although in another side pull roller blind of similar construction, DE-A-32 115 06, the construction includes a clamping device in which a stationary trunnion is surrounded by a clamping coil torsion spring which can be actuated by the drive wheel of the drive means, wherein the arrangement may also use a chain wheel with a string of bead members, nonetheless the actual drive means in that arrangement is of a complicated structure comprising a large number of individual components, and furthermore, that arrangement does not have any proper housing for the drive means. On the contrary, the respective carrier is of a housing-like construction. That structural-functional combination of the drive means and the carrier only apparently gives a simplification in design for in actual fact, in relation to the two sides of the roller blind, that arrangement certainly again involves a large number of different components and in particular the necessary exit opening in a peripheral or casing wall of the carrier, for the pull element to pass therethrough, constitutes a restriction from the outset, in regard to the aspect of universality of mounting of the system, thus restricting the system to just one mounting option. In that way the carrier can only ever be fitted on the right or on the left, depending on the design configuration. It is only ever possible to design it in a given configuration, for example only as a wall-mounted carrier. In that arrangement, the mounting of the roller blind roller is such that in practice it can only be fitted into position from above so that when using that system, there must still be sufficient space in an upward direction, and therefore it is not possible for the system to be installed closely below a ceiling.

The situation is similar in regard to another known side pull roller blind, USA-4 424 821. In that arrangement the drive transmission unit is of a particularly complicated construction comprising a large number of different individual components, although accordingly that arrangement provides for a reliable clamping effect even in relation to roller blinds of larger sizes. This arrangement also does not provide for a complete functional separation as between carrier and transmission unit so that as a result, in conjunction with the fixing elements which are only intended for two positions, this system is once again greatly restricted in regard to use, to only two predetermined mounting situations, for example as a

wall-mounted carrier or as a ceiling-mounted carrier.

Having regard to the fact that the drive means in that arrangement is disposed on the outside of the carrier, it is impossible from the very outset for the system to be mounted in a recess. In that connection, the mounting for the roller blind roller is such that it is not possible for the roller to be fitted and dismantled without releasing the fixing screws at least of one carrier.

According to the invention there is provided a side pull roller blind mechanism comprising two carriers, a roller blind roller, an apertured member which mounts one end of the roller blind roller and is to be fixed to one of the carriers, and a drive means which has a drive wheel around which passes a pull element, is connected by a push-in type rotary entrainment connection to the other end of the roller blind roller, includes a clamping means releasable by pulling on the pull element and has a housing which has an exit opening for the pull element and is to be fixed to the other of the carriers, wherein the apertured member and the housing of the drive means are each fixed to the respective one of the carriers by fixing elements provided on the apertured member and the housing laterally within the outline of the drive wheel and co-operating further fixing elements on the respective one of the carriers disposed in a circle in a pitch configuration which permits multiple relocation, the clamping means comprises a clamping torsion spring engaged on a trunnion on the housing of the drive means, and the push-in type rotary entrainment connection includes an entrainment disc which accommodates said other end of the roller blind roller in rotational entrainment relationship therewith and is drivingly connected to the drive wheel, with the inclusion of end members of the clamping torsion spring.

Such a side pull roller blind mechanism, while having a structural configuration of the utmost simplicity, in particular in regard to the number of different components involved, can be used in a generally universal fashion, both in regard to the nature of its mounting and in regard to the size and weight of the roller blinds.

By virtue of that configuration, it is possible for the two carriers to be identical. Thus, the drive means can be arranged without difficulty on the right or on the left, and the drive means and the carriers can also be disposed in different relative relocation positions with the exit opening for the pull element to issue from the housing of the drive means always at a desired position. Thus one and the same system can be readily used for mounting on a wall, a ceiling or in a recess. By virtue of the torsion spring being arranged within the housing which carries the trunnion, and the entrainment disc being mounted in the trunnion, a very small number of transmission components can be brought together in the transmission unit in a compact fashion and in a very constricted space. In that connection however, there can still readily remain sufficient space available, for example for the diameter and the number of turns of the spring, that the system can be equally well suited to light and to heavy roller blinds. Functional separation permits the use of roller blind rollers of either wood and metal. It can also be possible to use roller blind rollers of markedly different diameters, by virtue of the functional separation involved. By means of that system, the drive wheel may readily be a chain wheel which operates with a string of bead members. If necessary however it is also possible to use a cable wheel with a pull cable. The pull cable may be fitted with a cable tensioning member.

Further preferred embodiments of a universally usable side pull roller blind of that kind are characterised in the subsidiary claims. The features recited therein can contribute to a simple construction, to simplicity of mounting and dismantling, as well as to an aesthetically attractive and compact design configuration.

The invention is diagrammatically illustrated by way of example with reference to the accompanying drawings, in which:

Figure 1 shows an exploded diagrammatic view of the parts of a side pull roller blind mechanism according to one embodiment of the invention;

Figure 2 is a sectional view of drive means, mounted to its carrier, of the side pull roller blind mechanism of Figure 1, including an entrainment member which is connected to a roller blind roller, in a pushed-in or engaged condition;

Figure 3 is a plan view of an apertured member of the side pull roller blind mechanism of Figure 1;

Figure 4 is a plan view of an entrainment disc of the drive means of the side pull roller blind mechanism of Figure 1; and

Figure 5 is a plan view of a drive wheel of the drive means of the side pull roller blind mechanism of Figure 1.

Referring to the drawings, a side pull roller blind comprises a roller blind roller 1 which in the illustrated embodiment is in the form of a non-bored round wooden rod. An end pin 3 is fitted in one end of the roller blind roller 1 by means of an end cap 2. In the illustrated embodiment, an entrainment member 5 is fixed to the other end of the roller blind roller 1 by means of a collar or ferrule 4. The entrainment member 5, as part of a push-in type rotary entrainment connection, is of a non-round, for example hexagonal, cross-section. As can be seen from Figure 2, at its end which is towards the roller 1, the entrainment member 5 has a tooth arrangement 6 with which it can be anchored in the end face of

the wooden roller 1.

In a modification of the illustrated embodiment, it is also possible to use a roller blind roller in the form of a metal tube. In that case, fitted into the ends of the tube are bushes or wood plugs in which then the same end pin 3 and entrainment member 5 can again be fixed.

The end of the roller 1 which bears the end pin 3 is rotatably mounted in an apertured member 7 while at the other end of the roller 1 the entrainment member 5 is connected to drive means of the side pull roller blind. The drive means is a self contained functional unit which includes a housing 8 which is to be stationarily fitted to a respective one of a pair of carriers 25 in a manner described hereinafter, a clamping spring in the form of a coiled torsion spring 9, a drive wheel 10 which in the illustrated embodiment is in the form of a chain wheel, and, as a further part of the push-in rotary entrainment connection, an entrainment disc 11 between the drive wheel 10 and the roller 1.

The housing 8 which is to be mounted to the respective carrier in a stationary relationship is centrally provided with a trunnion 12 on which is disposed the clamping spring 9, with a number of windings suited to the size and weight of the roller blind. Formed at the two ends of the spring 9 are end members 13 which project radially beyond the windings of the spring.

The entrainment disc 11 is rotatably mounted within the trunnion 12 by means of a mounting trunnion 14. The mounting trunnion 14 comprises a plurality of spaced-apart trunnion segments 15 which at their free ends define a retaining or detent bead 16 so that the mounting trunnion 14 can be snapped into and retained within the interior of the trunnion 12 of the housing 8, as shown in Figure 2.

The entrainment disc 11 also has a mounting ring 17 which after assembly is disposed around the outside of the spring 9 and its end members 13 and on which the drive wheel 10 is disposed. The mounting ring 17 has a segment-shaped cut-out portion 18 (Figure 4) and a projection 19 which is also of a segment-like shape projects into the inside bore of the drive wheel 10 from a hub portion of the drive wheel 10 (Figure 5). The arrangement is such that, upon assembly of the apparatus, the segment-shaped projection 19 comes to lie approximately centrally in the segment-shaped cut-out portion of the entrainment disc 11, the cut-out portion 18 being larger than the projection 19. As shown in Figure 4, one or other of the end members 13 of the spring 9 are then disposed at the respective sides of the projection 19 so that, upon rotation of the drive wheel 10 by means of a bead cord 20 which is shown in Figure 2 and which passes around the drive wheel 10, in either of the two directions of rotation thereof, firstly the spring 9 is released from the trunnion 12 of the housing 8 and thereupon the corresponding side of the projection 19 on the drive wheel 10 comes into contact, with interposition of the respective spring end member 13, with the respective end face of the mounting ring 17 of the entrainment disc 11, which end face is formed by the cut-out portion 18, whereupon the entrainment disc 11 is entrained.

The mounting trunnion 14 in the entrainment disc 11 is in turn hollow and, by virtue of a correspondingly non-round cross-section bore, forms a plug-in receiving means for accommodating the entrainment member 5 at the respective end of the roller 1. Thus, the roller 1 can be rotated in one direction or the other by way of the entrainment disc 11 and the entrainment member 5. As soon as the pull on the cord 20 stops, the clamping spring 9 clamps fixedly on the trunnion 12 and, by way of the spring end members 13, prevents further rotary movement of the entrainment disc 11 and therewith the roller 1.

The foregoing description shows that the use of a very small number of simple components can provide a system which performs all the functions of such a side pull roller blind.

If desired, the drive wheel may be in the form of a pull cable wheel having a pull cable passing therearound, which cable can readily also be connected to a cable tensioning member which is of substantial dimensions according to the weight involved.

It will also be seen from the foregoing that, with the size of the drive wheel, it is practically possible to make use of the entire possible size of the interior of the housing 8 so that it is possible to use a large drive wheel, taking into account the spatial parameters. In that way it is possible for even wide heavy roller blinds to be operated with a relatively low level of pulling force.

The apertured member 7 which accommodates the end pin 3 of the roller blind roller 1 and which can be fixed to the corresponding one of the carriers 25 in a manner described hereinafter is of a special configuration for the purposes of inserting and mounting the end pin 3. As shown in Figure 3, two inclined grooves 21 start from the outside peripheral surface in the apertured member 7 on the face thereof which is towards the roller blind roller 1 and converge towards the centre where they communicate with each other, and a short radial groove 22 extends from the position of communication of the grooves 21 to a mounting bore 23 for the end pin 3, which mounting bore 23 is disposed centrally in the apertured member 7. The end pin 3 is secured in position by a small retaining bead 24 which projects into the radial groove 22.

By virtue of that configuration at the ends of the roller 1, assembly and dismantling can

be carried out without the need to unscrew from the window frame one of the carriers 25 which carry the apertured member 7 or the housing 8. The two inclined grooves 21 can also ensure that, when mounting the system it is possible for example closely to approach ceilings or other upwardly disposed obstacles or barriers and further that, in conjunction with the different relative positions to be described hereinafter with respect to the respective carriers 25, both in wall-mounted arrangements and in ceiling-mounted arrangements and also when the arrangements are mounted in recesses, there is always an inclined slot which is available in an appropriate position to receive the end pin 3.

For the purposes of fixing the housing 8 and the apertured member 7 each to a respective one of the two carriers 25, fixing elements are provided on the housing 8 on the outside thereof, more specifically within the outline of the drive wheel 10 disposed in the housing and in the same manner and at the same location, on the apertured member 7 on the outside thereof, with corresponding fixing elements being provided in support flanges 26 of the carriers 25 for the first-mentioned fixing elements. The arrangement in that respect is such that those fixing elements, on a notional circle, permit multiple relocation or transformation in position of the housing 8 and the apertured member 7 in relation to the carriers 25.

For that purpose, in the illustrated embodiment, provided on the corresponding outside of the housing 8 and of the apertured member 7 on the same pitch circle at uniform spacings of 90° relative to each other is a total of four push-in and detent projections 27 which are each of a split construction and have an outer detent bead 28. Disposed in the support flanges 26 of each of the two carriers 25 on the corresponding pitch circle and at 90° spacings are correspondingly shaped detent receiving means 29. By virtue of those relocation options, the side pull roller blind can optionally be mounted to ceilings or to walls as well as in recesses, with one and the same system that is to say using the same carriers 25. In addition, using one and the same system, the arrangement can also ensure that the drive of the side pull roller blind can be disposed either at the right or at the left.

In a modification of the illustrated embodiment, the housing 8 and the apertured member 7 are screwed to the corresponding carrier flanges 26 with the screw holes provided at corresponding spacings on a corresponding pitch circle.

Both when arranged on the right-hand side and when arranged on the left-hand side, the drive means, as such, always remains on the inward side, with respect to the support flange of the carrier, and therefore does not give rise to a visually unattractive appearance when the side pull roller blind is in the final mounted position.

The ability of base plates 30 of the carriers 25 to face inwardly can also contribute to a good visual aspect. For the purposes of fixing of the carriers 25 to a wall or a ceiling by means of screws, an advantageous embodiment provides that slots 31 are provided in the base plates 30 so that the spacing of the two carriers 25 relative to each other can be easily finely adjusted, as may be necessary, when mounting the side pull roller blind in position. The base plate 30 also has screw head recesses 32 so that the heads of fixing screws will project beyond the base plates 30, which would give rise to difficulties and would be visually unattractive.

For the sake of completeness, it should also be pointed out that the housing 8 has the usual exit opening (not shown) in its outside peripheral casing portion for the pull element to issue therefrom, in the illustrated embodiment the two runs of the bead cord 20.

As can be seen from Figures 1 and 2, the support flange 26 of each of the carriers 25 desirably has a central, relatively large mounting opening 33. The mounting openings 33 can be closed off by cover members 34 which each have four push-in projections 35 in the illustrated embodiment. The push-in and detent projections 27 on the apertured member 7 and on the housing 8 are in the form of hollow portions which receive the push-in projections 35.

CLAIMS

1. A side pull roller blind mechanism comprising two carriers, a roller blind roller, an apertured member which mounts one end of the roller blind roller and is to be fixed to one of the carriers, and a drive means which has a drive wheel around which passes a pull element, is connected by a push-in type rotary entrainment connection to the other end of the roller blind roller, includes a clamping means releasable by pulling on the pull element and has a housing which has an exit opening for the pull element and is to be fixed to the other of the carriers, wherein the apertured member and the housing of the drive means are each fixed to the respective one of the carriers by fixing elements provided on the apertured member and the housing laterally within the outline of the drive wheel and co-operating further fixing elements on the respective one of the carriers disposed in a circle in a pitch configuration which permits multiple relocation, the clamping means comprises a clamping torsion spring engaged on a trunnion on the housing of the drive means, and the push-in type rotary entrainment connection includes an entrainment disc which accommodates said other end of the roller blind roller in rotational entrainment relationship therewith and is drivingly connected to the drive wheel,

with the inclusion of end members of the clamping torsion spring.

2. A side pull roller blind mechanism according to claim 1, in which the entrainment disc is rotatably mounted by means of a mounting trunnion in the trunnion of the housing, which mounting trunnion is formed from trunnion segments which at their free ends define a retaining bead, whereby it can be fitted into the trunnion with retaining snapping engagement.

3. A side pull roller blind mechanism according to claim 2, in which the mounting trunnion of the entrainment disc is formed as a hollow portion of non-round cross-section and is formed as a receiving means for an entrainment member of corresponding non-round cross-section, which is fixed to said other end of the roller blind roller.

4. A side pull roller blind mechanism according to claim 3, in which the entrainment member is provided on its end face towards the roller blind roller with a tooth configuration which engages into the end face of the roller blind roller.

5. A side pull roller blind mechanism according to any one of claims 1 to 4, in which the entrainment disc has a mounting ring which engages around the clamping torsion spring and the end members thereof, the drive wheel is disposed on the mounting ring and the mounting ring has segment-shaped cut-out into which projects a projection, which is of smaller segment size, on the drive wheel, wherein the two end members of the clamping torsion spring are disposed at respective sides of the projection between the sides thereof and the ends of the cut-out portion of the mounting ring.

6. A side pull roller blind mechanism according to any one of claims 1 to 5, in which for the purposes of mounting and dismantling of an end pin at said one end of the roller the apertured member, on its side which is towards the roller blind roller, has two inclined grooves therein which converge towards each other from the outer periphery and which communicate with each other in the middle region, and a short radial slot extends from the position of communication of the inclined grooves, to a central mounting bore for the end pin.

7. A side pull roller blind mechanism according to claim 6, in which a retaining bead for the end pin is provided in the radial grooves.

8. A side pull roller blind mechanism according to any one of claims 1 to 7, in which the fixing elements on the apertured member and the housing and the further fixing elements on the carriers are disposed on said circle at a uniform pitch relationship of 90°.

9. A side pull roller blind mechanism according to any one of claims 1 to 8, in which the fixing elements on the apertured member and on the housing are formed by detent projections and the co-operating further fixing elements on the carriers are formed by detent receiving means in support flanges of the carriers.

10. A side pull roller blind mechanism according to any one of claims 1 to 9, in which provided in base plates of the carriers for screw fixing thereof are slots and also recesses for accommodating heads of fixing screws.

11. A side pull roller blind mechanism according to claim 9 or claim 10 when appendent to claim 9, in which provided in the support flanges of the carriers are central mounting openings which can be closed outwardly by cover members.

12. A side pull roller blind mechanism according to claim 11, in which the cover members have push-in projections and the push-in detent projections on the apertured member and the housing are in the form of hollow portions for receiving the push-in projections.

13. A side pull roller blind mechanism substantially as hereinbefore described and illustrated with reference to the accompanying drawings.

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